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Killworth, Gottman, Hagan & Schaeff, L.L.P.
Suite 500
One Dayton Centre
Dayton, OH 45402-2023

EXAMINER

KORNAKOV, MICHAIL

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Paper No. 011604

Application Number: 09/998,073
Filing Date: November 30, 2001
Appellant(s): SANDHU ET AL.

William A. Jividen, Esq.
For Appellant

EXAMINER'S ANSWER

MAILED
SEP 14 2004
GROUP 1700

This is in response to the appeal brief filed November 24 2003.

(1) *Real Party in Interest*

A statement identifying the real party in interest is contained in the brief.

(2) *Related Appeals and Interferences*

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) *Status of Claims*

The statement of the status of the claims contained in the brief is correct.

(4) *Status of Amendments After Final*

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

The amendment after final rejection filed on November 26,2003 has been entered. Appellant's statement that the amendment goes to grammatical and typographical matters is accepted.

(5) *Summary of Invention*

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is substantially correct. The changes are as follows: All text after paragraph (1) appears redundant or argumentative.

(7) Grouping of Claims

The appellant's statement in the brief that certain claims do not stand or fall together is not agreed with because it appears to the issues are identical, see e.g. appellants arguments on page 7, second paragraph, and the first full of page 8 states that Elliott does not teach that the beam should be adapted or configured such that it "converges...in close proximity to, but not on, said workpiece" as recited in the claims 46 and 64. Appellant acknowledges that the issue relates to the weight accorded, to what appellant has termed, "functional language". This examiner acknowledges that the terms of the various claims are not identical, however the issue appears to be indistinguishable, and as such, the claims stand or fall together.

(8) Claims Appealed

A substantially correct copy of appealed claims appears beginning on page 12 of the Appendix to the appellant's brief. The minor errors are as follows: Claim 59 is cancelled.

(9) Prior Art of Record

5,669,979

Elliott et al.

9-1997

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 46-58 and 60-69 are rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent No. 5,669,979 to Elliott et al. (Elliott).
2. As an initial matter, the claims are drawn to a “system”. A “system” is an “apparatus.” See *Ex parte Alfred A. Fressola* 27 U.S.P.Q.2d 1608 citing *In re Walter*, 618 F.2d 758, 762 n.2, 205 USPQ 397, 402 n.2 (CCPA 1980). As such, only structural limitations, or structural imparting functions are construed to properly limit the claims.
3. With specific respect to claims 46, 62-64, and 66-68, requiring an “inlet”, presumably into some containment structure, for exposing a workpiece to gas. A radiation beam source adapted to converge in close proximity to the surface of the workpiece. Elliott discloses, in figure 15, and associated text, an inlet (not shown but feeding element 434 which is a nozzle). The workpiece is disclosed as element 414. The radiation source (element 422) is disclosed as a laser. The beam is shown to converge at the workpiece see element 416. As to claim 62, the recitation that the convergence takes place in the gaseous layer, without indicating where the

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gaseous layer is, does not impart additional structure. The beam is already disclosed to converge in claim 46. As to claim 63, the system of Elliot could perform the recited functions when in operation. It is not clear what additionally structural limitation is being claimed. See page 2 of Paper 040403. The claims are rejected according to the base claim from which they depend.

With respect to claims 66 and 67 the nature of the gas used when the apparatus is in operation does not impart additional structure. Similarly, with respect to claim 68, since a wavelength is disclosed in Elliot, it is predetermined. See page 2 of Paper 040403.

4. As to claim 47 disclosing optics to focus the beam, element 428 is an optical focusing element, more specifically, a cylindrical mirror.

5. As to claim 48, disclosing a structure for causing relative motion between the surface and the beam, the stage (element 440) is disclosed to translate the chuck (element 436) and substrate (element 414) at a constant rate across the reaction chamber from a rear end (element 476) to a forward end (element 478). This translation provides the requisite relative motion.

6. As to claim 49, disclosing a chamber having a window. The chamber (or containment system) was generally presumed to exist in claim 46. The chamber and window are similarly disclosed in figure 15. The chamber does not appear to be numbered but is explicitly disclosed at e.g. column 20, line 18 *et seq.* the window is explicitly disclosed, as such at e.g. column 20, line 41 *et seq.* disclosing: "the chamber may have a flat window, with the converging lens or mirror located outside the chamber."

7. As to claim 50, disclosing that the source of electromagnetic radiation produces UV radiation. The same is disclosed in Elliott see e.g. column 10, line 17 *et seq.* disclosing "... a pair of mirrors 50 and 52 could be arranged to act cooperatively on an incoming light beam 54

generated by a deep UV light source...”.

8. As to claim 51, disclosing that the optics are such that beam convergence makes a “wide scanning beam”, the same is identically disclosed in *inter alia*, figures 2 and 2A. Referring to FIGS. 2 and 2A, the elongated dimension 46 of beam 42 at a substrate surface is selected based largely upon the size of the substrate to be cleaned. Thus, the final beam striking the surface gives the appearance of a knife-edge. Alternatively, flat mirror 40, may be replaced by a cylindrical focusing mirror 41, as shown in FIG. 2A. See e.g. column 9, line 66 *et seq.*

9. As to claim 52, disclosing that the point of convergence is between about 2 and 4 millimeters. The arrangement of the optics is disclosed in figure 2A and relevant associated text. In a larger sense, the height of the sample may be adjusted for virtually any separation. This claim very narrowly further limits its base claim structurally.

10. As to claim 53 disclosing an exhaust pump. The same is disclosed in figure 11 and associated text see e.g. column 17, line 38 *et seq.* Specifically an exhaust nozzle (element 292 in FIG. 11) is coupled to a vacuum pump (element 294) and provides a high velocity exhaust near the cloud of ablated foreign material to evacuate the reacted and unreacted ablation components in the cloud.

11. As to claim 54, disclosing a nozzle. The nozzle is disclosed as element 434, in figure 15 and in associated text. The nozzle inherently could deliver a laminar flow, depending *inter alia* on the flowrate. Turbulence is a function of flowrate.

12. As to claim 55, disclosing a heater for heating the workpiece. As an initial matter, the light source would heat the workpiece and as such the heater could be the light source. Nonetheless, figure 11A at element 284 and associated text discloses a heating element.

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13. As to claims 56 and 61, disclosing a temperature sensor, a pressure sensor, and a gas sensor, the same are disclosed at e.g. column 6, line 6. Elliott discloses that the process is carefully controlled. The controlled process aspects include the input fluid composition, temperature, and pressure. Inherent in controlling the same, is a means for monitoring the variables.

14. As to claim 57, disclosing a mixing chamber, element 524 in figure 16, and associated text, discloses the same, in the context of the claimed system.

15. As to claim 58, the type of gas is not a structural limitation. See Paper 040403 at page 2.

16. As to claim 60, disclosing a holder for the substrate, a chuck (element 436) is disclosed in figure 15 and associated text.

17. As to claim 65, disclosing that the gas flow is laminar, the same is disclosed in Elliot. Specifically, Elliott discloses: "in one configuration, the reaction chamber is fitted on one end with an 'intake' gas manifold and on the other with an 'exhaust' manifold which creates laminar flow of gas through a very narrow, low profile (and hence low volume) reaction chamber." See e.g. column 20, line 52 *et seq.*

18. As to claim 69, disclosing that the wavelength is between 190 and 250 nm. Elliott discloses that the beam may include ultra-violet radiation in the wavelength range 4 nm to 380 nm. See e.g. column 3, lines 1-17.

(11) Response to Argument

Appellants' have correctly characterized the position of this examiner in stating: "the Examiner

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states that "as an initial matter, the claims are drawn to a "system" A "system" is an "apparatus."... As such, only structural limitations, or structural imparting functions are construed to properly limit the claims."

Appellant then argues that the examiner's anticipation rejection of independent claim 46 is founded on ignoring the functional language:

[A]dapted to converge a beam produced thereby in said flow in close proximity to the surface of the workpiece, but spaced a finite distance therefrom, to dissociate said gaseous constituent to produce a high flux of activated reactive species that chemically treats said surface of said workpiece.

This examiner does not ignore the functional language, but accords weight only to the extent that the apparatus is structurally limited by the functional recitation. Elliott discloses an optical component that functions to converge a beam, wherein the point of convergence is adjustable and a gas nozzle is proximate the treated surface. Specifically, Elliott in referring to FIG. 2A discloses at column 10, line 13, "[t]hus the final beam striking the surface gives the appearance of a knife edge." The actual point of convergence relative to the wafer is adjustable either by adjusting the thickness of the workpiece, adjusting the optics (figures 3A and 3B show different energy densities at the work piece surface) or moving the optics. Elliott further discloses at column 12, line 6 that a "focused light beam from a UV floodlamp, which produces relatively high energy density light at wavelengths below 200 nm, could be used to generate highly

reactive ozone from an oxygen atmosphere to enhance the photoreactive process.” This is exactly what appellants’ invention does.

Thus, the sole feature that is not explicitly present, is the disclosure of the location of the point of convergence. However, as indicated above, the apparatus of Elliott could function as appellants’ invention does by: using a thinner substrate (resulting in the system of Elliott having a point of convergence above the surface); changing the medium through which the light travels (illustrated in figure 12, light moving from a less optically dense to a more optically dense medium results in an above wafer convergence point), or adjusting the optical components (i.e. lenses), changing wavelength etc. Elliott discloses under the heading “Beam Shape and Dimensions” that the “narrow dimension 48 of the beam *is selected* largely by the beam energy supplied by the laser; both of these parameters are governed by the energy density required for efficient cleaning.” (Emphasis added). The disclosed variation is shown in figures 2 (element 48) and 2A (element 42).

Appellants cite *In re Swinehart* 169 USPQ 226 (CCPA) (hereinafter *Swinehart*) for the proposition that “there is nothing inherently wrong with defining some part of an invention in functional terms”. *Swinehart* was directed to a claim, which in essence, disclosed a material that possessed characteristics not previously known. Namely, the *Swinehart* claim was directed to an IR transparent material with the same composition as the prior art, but the prior art was not transparent. Thus, in *Swinehart* the “function” was an intrinsic property; namely, the ability to pass IR light. In contrast, the present invention’s sole point of novelty is the manner in which the

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apparatus is used. The apparatus in Elliott is wholly identical, and structurally indistinguishable from the claimed apparatus. Appellants may have a novel method of *using* the apparatus but that is not what is currently claimed. The instant situation is in stark contrast to *Swinehart*, where the prior art ***could not*** operate in the same way, i.e. the prior art was opaque to IR light while the invention was transparent. In the instant case, the invention of Elliott need not be operated in the manner claimed, but it ***could*** operate in the same way, because it is structurally identical.

Appellant argues that *In re Venezia*, 189 USPQ 149 (CCPA 1976) is “directly on point and controls in this situation.” Appellant seems to indicate that *Venezia* includes text to the effect that “functional language... cannot be disregarded.” This examiner was unable to find such language in the case. *Venezia* was concerned with an indefiniteness issue, and the matter was resolved in appellant’s favor, the Court finding that functional language did not render the claim indefinite. However, the Court also stated with respect to the functional language: “what may or may not happen in the future is *not* a part of the claimed invention.” *Id* at 151. (Emphasis original). The Court went on to hold:

“a pair of sleeves * * * each sleeve of said pair adapted to be fitted over the insulating jacket of one of said cables.” Rather than being a mere direction of activities to take place in the future, this language imparts a structural limitation to the sleeve. Each sleeve is so structured or dimensioned that it can be fitted over the insulating jacket of a cable.

This is consistent with the position that this examiner has taken throughout prosecution. See *e.g.* page 4, paragraph 15 of the final rejection, stating, “a reference capable of performing the same

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function and possessing the same structure will provide a proper anticipation rejection.” Elliot, as discussed above, uses focused light (laser UV etc.) to generate a radical species in close proximity to a workpiece, and the point of convergence is disclosed, and shown, to be adjustable.

Finally, with respect to the arguments directed to the independent claims, appellant concludes by stating: “Applicant’s note that nowhere in the disclosure of Elliot et al. is there any teaching that that the beam should be adapted or configured such that it ‘converges...in close proximity to but not on, said workpiece’ as recited in claims 46 and 64.” This examiner notes that inserting a thinner wafer into the device of Elliott, thus allowing the incident radiation to converge above the surface, would result in what appellants appear to admit would be an identical invention. It is also noted that if the “substrate chuck 436” of Elliott were called a “workpiece” the Elliott device would apparently meet appellant’s requirement for convergence. Similarly, if a thicker “workpiece” were placed on appellant’s “conventional chuck 17” appellant’s invention would have a beam that converges at the surface of the workpiece and the resulting device would be identical to the invention disclosed in Elliot.

Appellant has relied on the argument drawn to the independent claims and has not submitted separate arguments for the dependant claims. Therefore, this examiner relies on the rejection, which is of record.

In conclusion, the device of Elliott is structurally indistinguishable from appellants claimed device. Appellants arguments are based solely on how appellant will use the apparatus. The prior art apparatus is wholly identical to the claimed apparatus. Appellant has failed to meet the novelty requirements set forth in 35 U.S.C. § 102(b) and, as such, is not entitled to a patent.

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For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Gentle E. Winter
Examiner
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September 2, 2004

Conferees
Michael Barr
Roy King

Killworth, Gottman, Hagan & Schaeff, L.L.P.
Attn: William A. Jividen, Esq.
Suite 500
One Dayton Centre
Dayton, OH 45402-2023


MICHAEL BARR
SUPERVISORY PATENT EXAMINER

- Conferees

APPEAL CONFERENCE: 
ROY KING
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700